OPERATING SUMMARY

ONTARIO MINISTRY OF ENVIRONMENT
36936000023216

CONISTON

water pollution control plant

1968

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Division of Plant Operations

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Coniston : water pollution
control plant.
81244

Water management in Ontario

Ontario
Water Resources
Commission

135 St. Clair Ave. W.
Toronto 7
Ontario

We are pleased to present you with the Operating Summary for the water pollution control facilities operated for you during 1968.

Both the financial and technical information presented should be of assistance to your present and future planning in this important phase of municipal activity.

A new format has been devised to allow greater readability with equally detailed content. We trust that this will meet with your approval.

Our staff wish to express their appreciation for your co-operation throughout the year.

D. S. Caverly
D. S. Caverly,
General Manager.

D. McTavish
D. A. McTavish, P. Eng.,
Director,
Division of Plant Operations.

[illegible] Ontario
[illegible]

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ONTARIO WATER
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CONISTON

water pollution control plant

operated for

THE TOWN OF CONISTON

by the

ONTARIO WATER RESOURCES COMMISSION

1968 ANNUAL OPERATING SUMMARY

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R. Kauppinen

135 St. Clair Avenue West
Toronto 7

FOREWORD

● This operating summary outlines the project's technical capabilities and financial status in 1968. Such information mirrors past and present performance, but a major intention is to anticipate the future -- to solve problems before they occur.

The new format in which this year's data are presented is designed to offer a higher level of readability than in the past, without a corresponding decrease in compactness, accuracy and detail.

Although your Regional Operations Engineer carries the major responsibility for the contents of the report, those involved in its preparation are attached to several Commission sections and divisions. The statistics section of the Division of Plant Operations compiled the information for the graphs and charts. The draughting section of the Division of Sanitary Engineering drew the graphs. The Division of Finance provided all cost data.

Only the close co-operation of these departments allowed the publication of this summary.

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'68 REVIEW

A total of 72.488 million gallons was treated in 1968, which represents an average daily flow of 198,000 gallons. Approximately 95 percent of the time the daily flow exceeded the design flow for the plant.

The treatment efficiency in 1968 indicates an overload, as the efficiency was reduced to 64 percent of BOD and 69 percent of suspended solids.

The total operating cost for the year was $14,885.11 or $205.35 per million gallons treated compared to $13,350.51 or $192.66 per million gallons in 1967.

The consulting firm of Canadian Mitchell Associates Limited was engaged, and prepared a report which recommended immediate expansion of the treatment facilities and changes to the collector system. Subsequently, the Town made an application to the OWRC to implement the recommendations of the report.

PROJECT COSTS

NET CAPITAL COST (Final) Long Term Debt to OWRC	$468,190.39

Debt Retirement Balance at Credit (Sinking Fund) December 31, 1968	$109,580.77

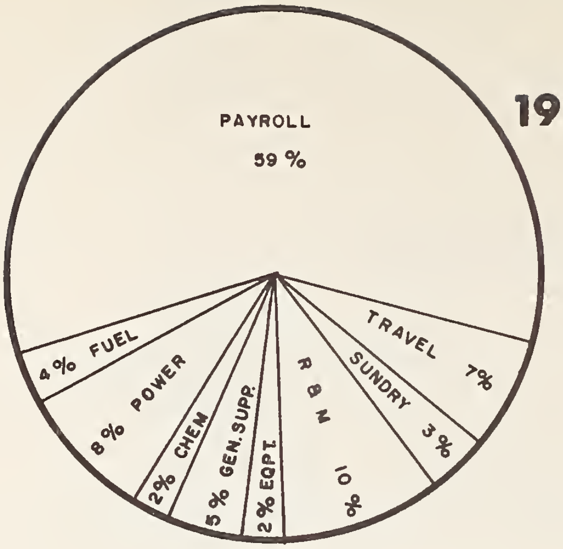
Net Operating	$ 14,885.11
Debt Retirement	9,448.00
Reserve	2,802.90
Interest Charged	26,285.82
TOTAL	$ 53,421.83

RESERVE ACCOUNT

Balance at January 1, 1968	$ 17,634.00
Deposited by Municipality	2,802.90
Interest Earned	986.00
	$ 21,422.90
Less Expenditures	3,998.83
Balance at December 31, 1968	$ 17,424.07

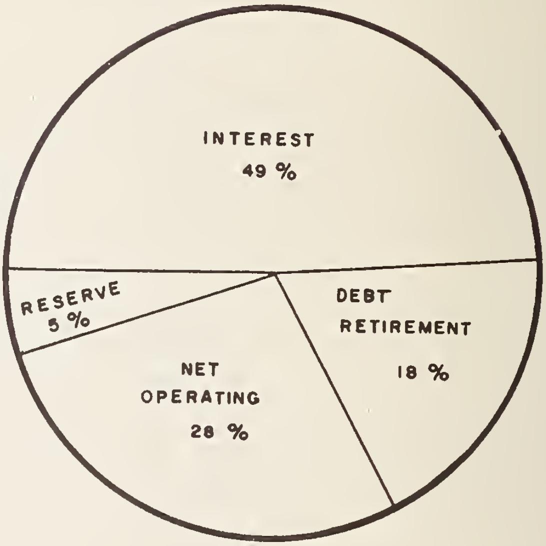
Monthly Operating Costs

MONTH	TOTAL EXPENDITURE	PAYROLL	CASUAL PAY ROLL	FUEL	POWER	CHEMICAL	GENERAL SUPPLIES	EQUIPMENT	REPAIRS & MAINTENANCE	SUNDRY	WATER	TRAVEL
JAN	893.45	509.68	98.21	31.76	125.81	-	62.72	-	-	18.17	-	47.10
FEB	930.03	505.64	84.84	52.65	111.40	-	36.46	-	18.10	18.49	-	102.45
MAR	1417.40	745.35	230.16	96.92	114.54	-	94.24	-	26.72	38.97	-	70.50
APRIL	1256.31	525.80	174.59	49.30	113.42	-	33.52	-	247.86	21.22	-	90.60
MAY	1556.77	570.15	100.12	-	91.81	238.61	52.40	311.87	88.49	31.77	-	71.55
JUNE	834.16	457.27	128.66	58.95	88.04	-	18.72	-		18.17	-	64.35
JULY	1068.85	471.24	219.25	-	80.98	-	76.12	-	90.68	71.18	-	59.40
AUG	1290.33	691.01	136.92	64.52	70.62	-	32.43	-	212.03	-	-	82.80
SEPT	1295.48	473.26	105.40	-	96.77	-	45.41	-	456.34	20.80	-	97.50
OCT	1235.75	507.63	140.76	-	107.41	123.64	38.76	-	195.18	19.43	-	102.94
NOV	1125.17	450.49	48.88	40.35	104.53	-	59.03	-	61.29	187.61	-	172.99
DEC	1981.41	1177.82	223.92	136.29	131.56	-	128.10	62.40	30.55	63.50	-	27.27
TOTAL	14885.11	7085.34	1691.71	530.74	1236.89	362.25	677.91	374.27	1427.24	509.31	-	989.45



1968 OPERATING COSTS

TOTAL ANNUAL COST



Yearly Operating Costs

YEAR	M.G.TREATED	TOTAL COST	COST PER MILLION GALLONS	COST PER LB OF BOD REMOVED
1964	65.844	$11,738.97	$178.28	9 cents
1965	72.875	12,495.59	171.47	12 cents
1966	63.139	11,578.81	183.29	11 cents
1967	69.296	13,350.51	192.66	13 cents
1968	72.488	14,885.11	205.35	17 cents

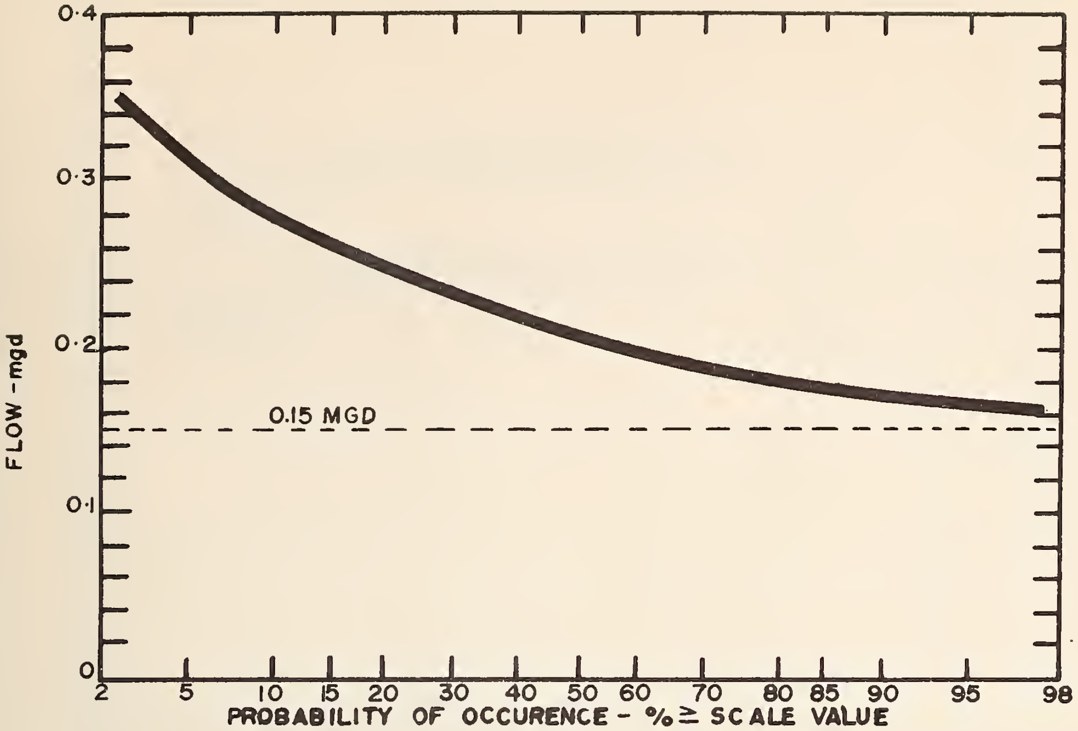
Process Data

A total flow of 72.488 million gallons was treated in 1968 for an average daily flow of 198,000 gallons. This is an increase of approximately four percent over the 1967 flow. Approximately 95 percent of the time, the daily flow was greater than the design flow for secondary treatment of 150,000 gallons per day.

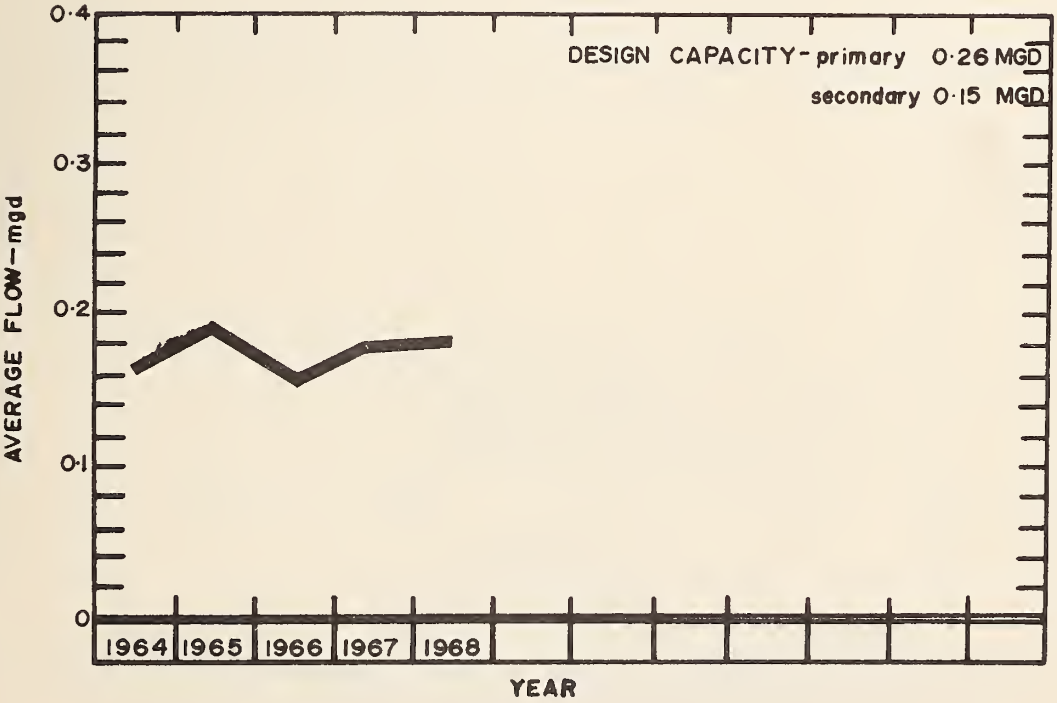
The final effluent was chlorinated from May to October. A total of 2,100 pounds of chlorine was used for an average dosage of approximately 6.5 mg/l.

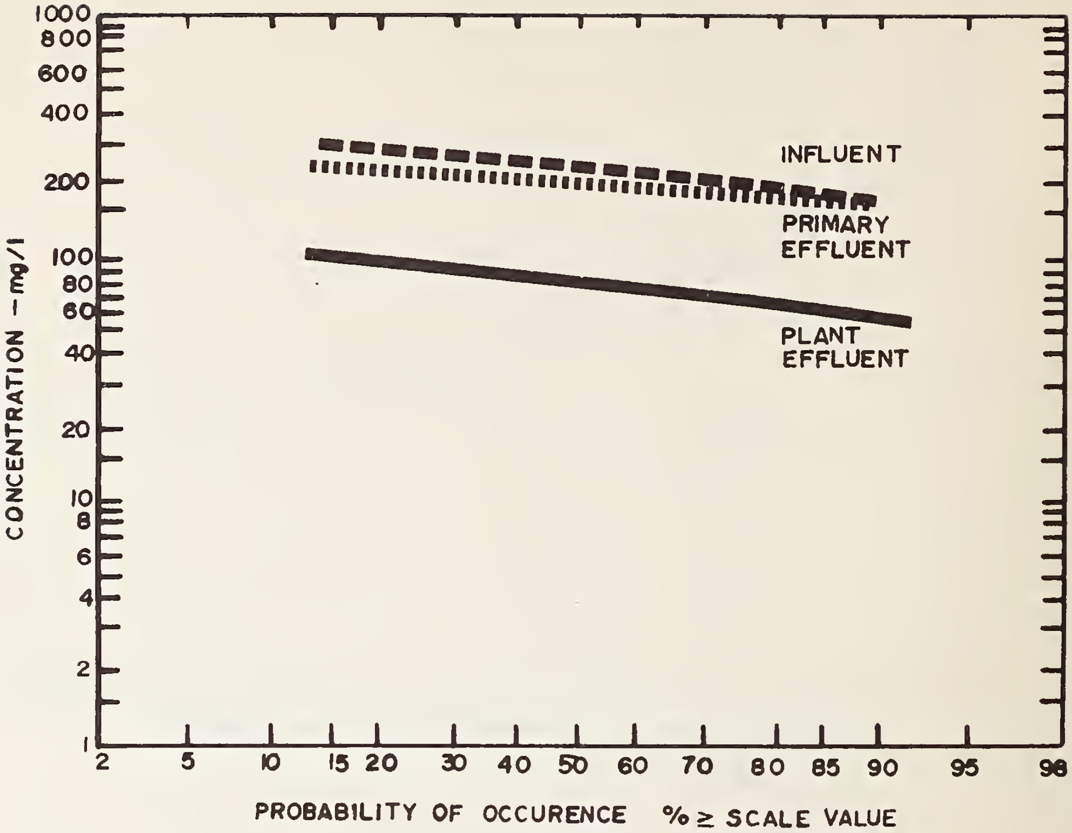
PLANT FLOWS and CHLORINATION

MONTH	TOTAL FLOW mg	AVERAGE DAILY FLOW mg	MAXIMUM DAILY FLOW mg	MINIMUM DAILY FLOW mg
JAN	5.897	.190	.399	.071
FEB	5.828	.201	.264	.172
MAR	7.135	.230	.336	.119
APR	7.573	.252	.340	.143
MAY	6.893	.222	.300	.165
JUN	5.724	.191	.288	.113
JUL	5.719	.185	.211	.139
AUG	5.280	.169	.192	.143
SEPT	5.271	.176	.243	.136
OCT	5.569	.180	.199	.163
NOV	4.880	.163	.216	.127
DEC	6.769	.218	.483	.116
TOTAL	72.488	-	-	-
AVERAGE	-	.198	-	-

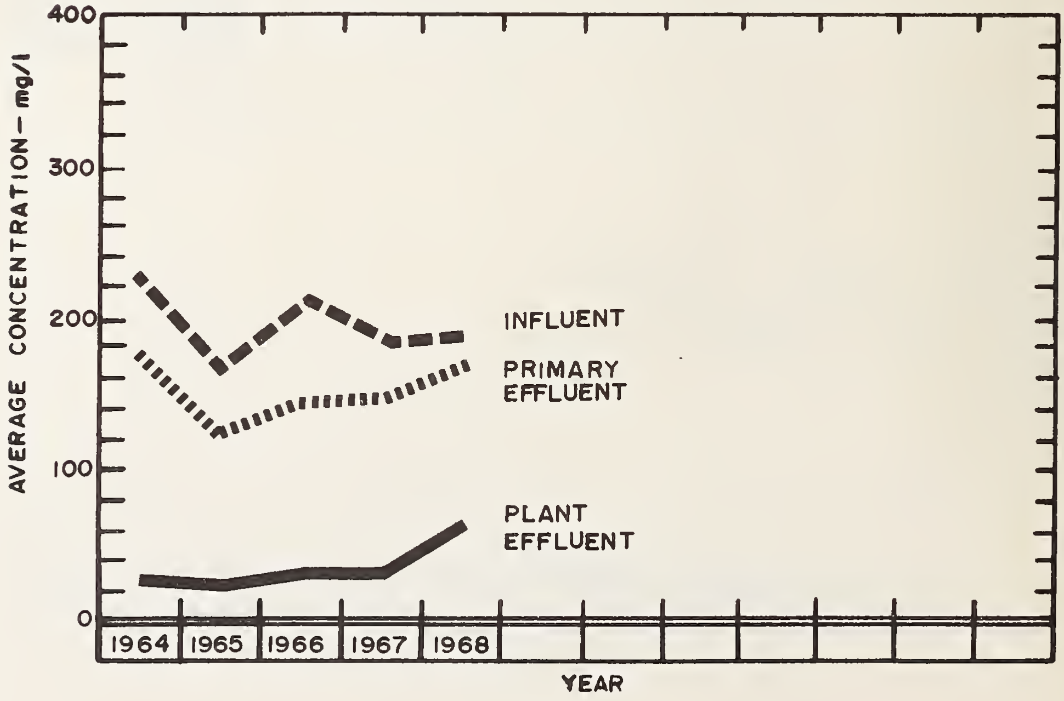

0·4
0·3
0·2
0·1
0
FLOW - mgd
0.15 MGD
2
5
10
15
20
30
40
50
60
70
80
85
90
95
98
PROBABILITY OF OCCURENCE - % ≥ SCALE VALUE

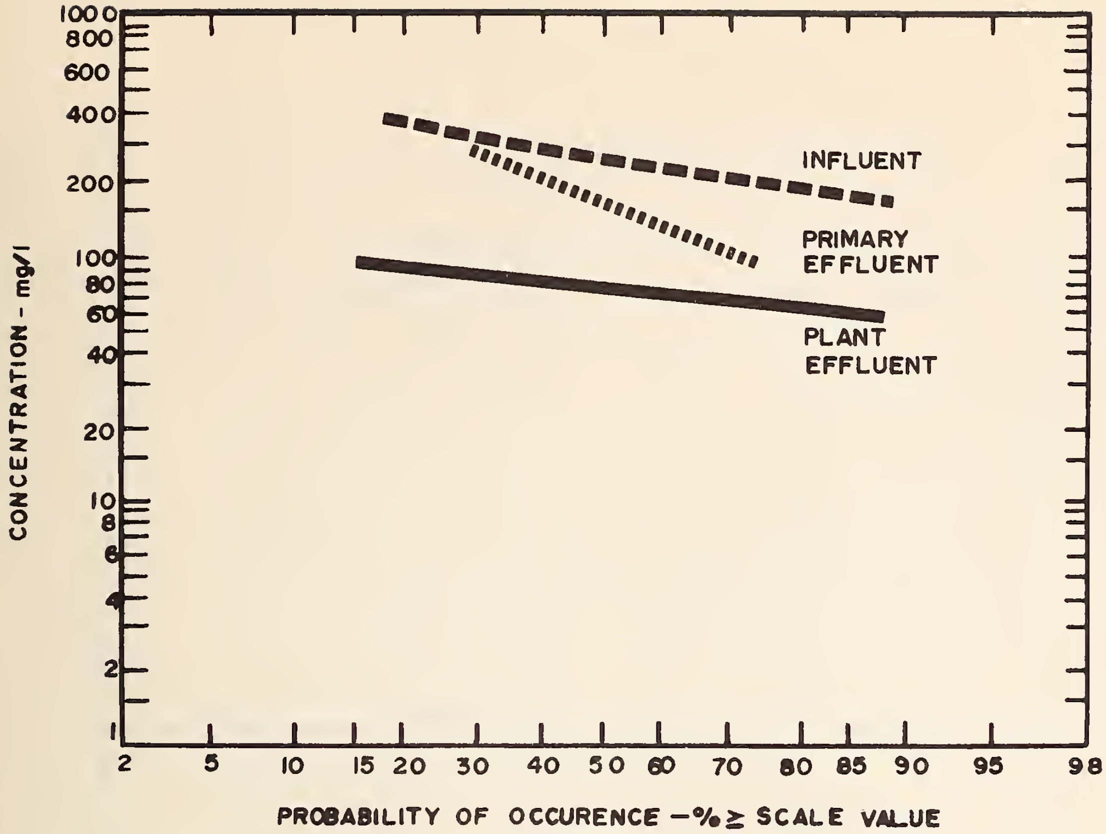
FLOWS


0·4
0·3
0·2
0·1
0
AVERAGE FLOW – mgd
DESIGN CAPACITY - primary 0·26 MGD
secondary 0·15 MGD
1964
1965
1966
1967
1968
YEAR

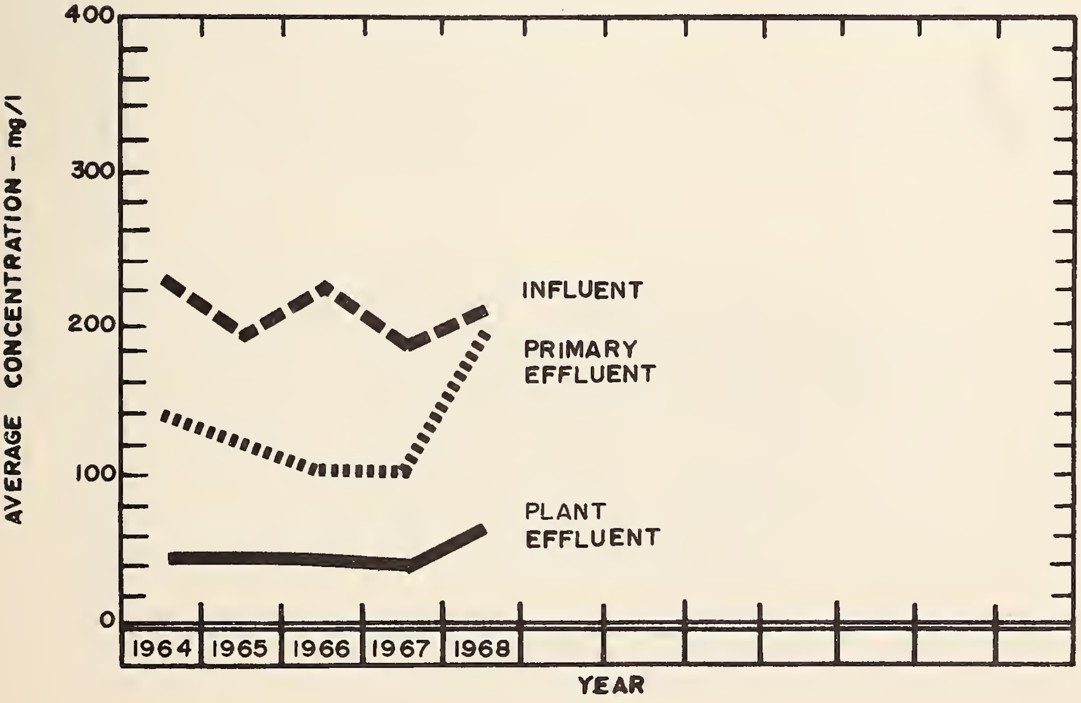


BIOCHEMICAL OXYGEN DEMAND





SUSPENDED SOLIDS



PLANT EFFICIENCY

MONTH	BIOCHEMICAL OXYGEN DEMAND				SUSPENDED SOLIDS				GRIT
	INF CONC^{N} mg/l	EFF CONC^{N} mg/l	RED^{N} %	REMOVAL 10^3 lb	INF CONC^{N} mg/l	EFF CONC^{N} mg/l	RED^{N} %	REMOVAL 10^3 lb	REMOVAL ft^3
JAN	190	94	50	5.66	183	90	51	5.48	60
FEB	-	-	-	-	-	-	-	-	45
MAR	-	-	-	-	-	-	-	-	60
APR	160	72	55	6.66	115	77	33	2.88	45
MAY	135	46	66	6.14	215	53	75	11.17	45
JUN	-	-	-	-	-	-	-	-	60
JULY	195	61	69	10.80	248	57	77	10.92	75
AUG	-	-	-	-	-	-	-	-	60
SEPT	-	-	-	-	-	-	-	-	75
OCT	270	78	71	10.69	345	37	89	17.15	45
NOV	-	-	-	-	-	-	-	-	45
DEC	200	55	72	9.81	150	70	53	5.42	30
TOTAL	-	-	-	49.76	-	-	-	53.02	645
AVERAGE	191	68	64	-	209	64	69	-	54

COMMENTS

The raw sewage had an average concentration of 191 mg/l BOD and 209 mg/l suspended solids. The average concentration in the final effluent was 68 mg/l BOD and 64 mg/l suspended solids. This indicates a 64 percent BOD reduction and 69 percent suspended solids reduction, both of which are less than the reductions normally expected for secondary treatment.

The quality of the effluent exceeded OWRC objectives of 15 mg/l for both BOD and suspended solids at plants with secondary treatment.

A total of 645 cubic feet of grit was removed at an average of 9.0 cubic feet per million gallons treated.

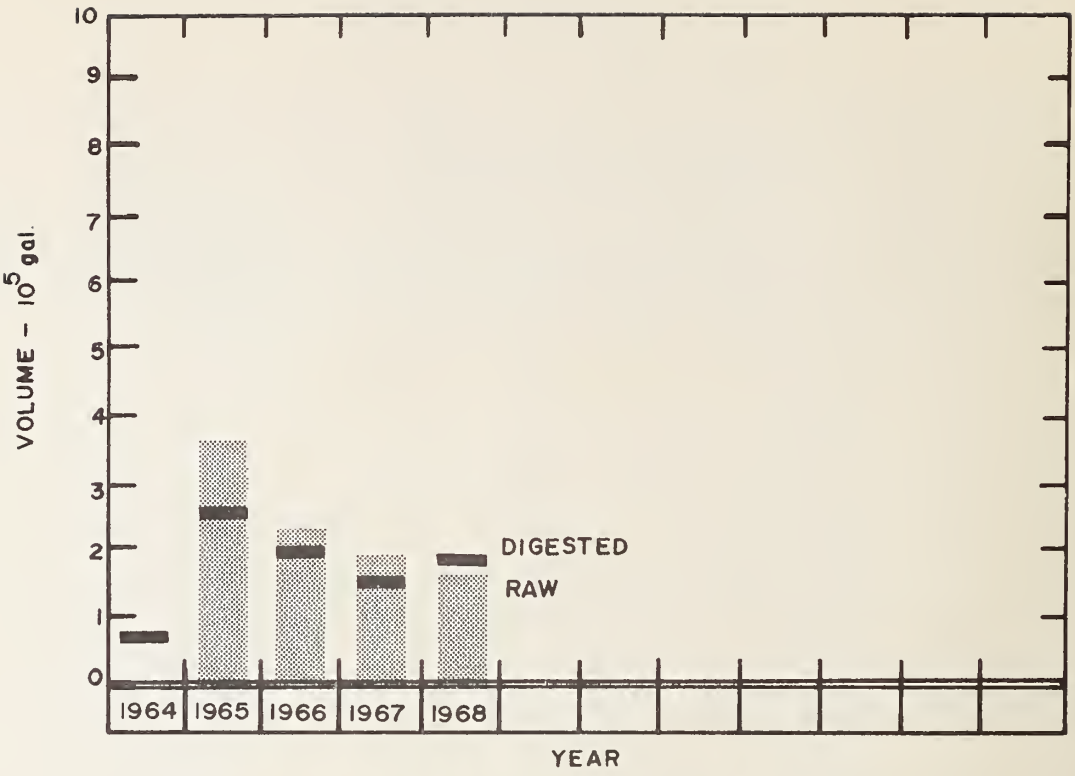
AERATION

MONTH	AVERAGE FLOW mgd	PRIMARY EFF BOD CONC^N mg/l	PRIMARY EFF SS CONC^N mg/l	SECONDARY EFF BOD CONC^N mg/l	SECONDARY EFF SS CONC^N mg/l	ML SS CONC^N mg/l	F/M (lb BOD / lbMLSS)	AIR USED (1000 ft / lb BOD) REMOVED	WASTE SLUDGE lb
JAN	.190	210	149	94	90	1220	.59	-	-
FEB	.201	-	-	-	-	1840	-	-	-
MAR	.230	-	-	-	-	-	-	-	-
APRIL	.252	165	95	72	77	1030	.73	-	-
MAY	.222	120	110	50	63	1420	.34	-	-
JUN	.191	-	-	-	-	1480	-	-	-
JUL	.185	175	224	62	53	1680	.35	-	-
AUG	.169	-	-	-	-	1740	-	-	-
SEPT	.176	-	-	-	-	1760	-	-	-
OCT	.180	165	92	58	37	1446	.37	-	-
NOV	.163	-	-	-	-	1775	-	-	-
DEC	.218	200	510	55	70	-	-	-	-
TOTAL	-	-	-	-	-	-	-	-	-
AVERAGE	.198	173	197	65	65	1539	.48	-	-

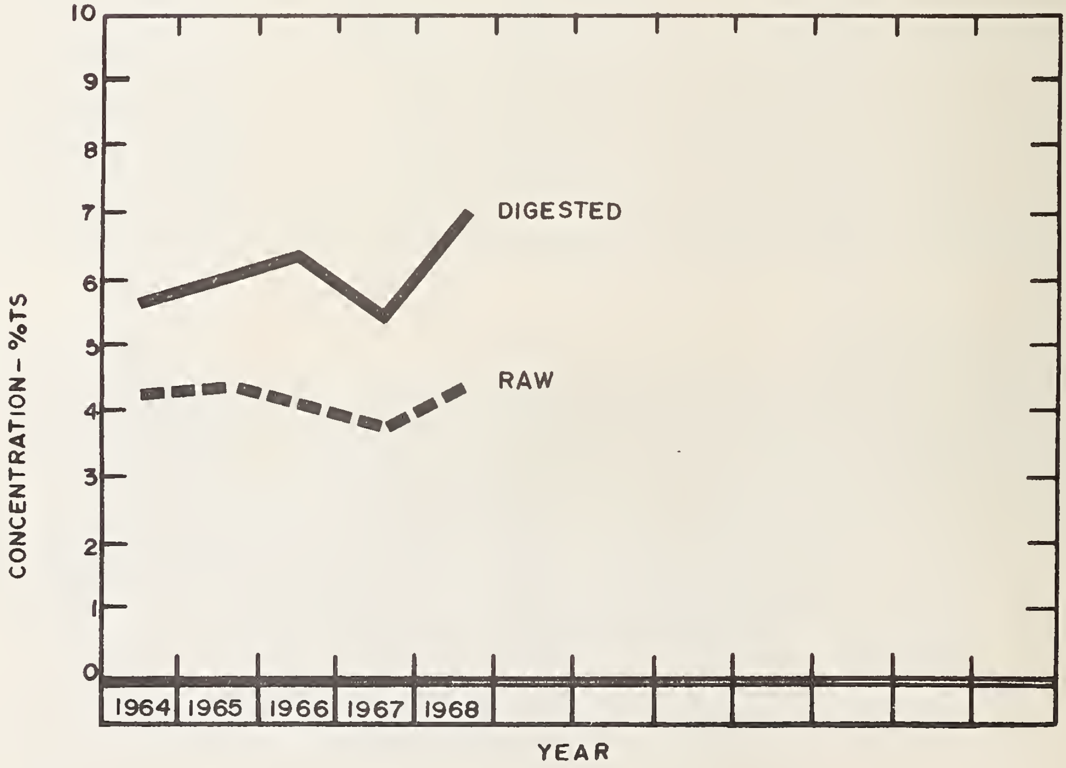
COMMENTS

The average mixed liquor suspended solids concentration in the aeration tank was 1,539 mg/l. The average concentration in the primary effluent was 173 mg/l BOD, resulting in a loading on the aeration section of 48 pounds of BOD per 100 pounds MLSS or an F/M ratio of 0.48.

Since mechanical aeration is used at the plant, there is no direct means of measuring the air used. Tests taken regularly indicated that satisfactory dissolved oxygen was maintained in the aeration section.


VOLUME - 10^5 gal.
10
9
8
7
6
5
4
3
2
1
0
1964
1965
1966
1967
1968
YEAR
DIGESTED
RAW

DIGESTION


CONCENTRATION - %TS
10
9
8
7
6
5
4
3
2
1
0
1964
1965
1966
1967
1968
YEAR
DIGESTED
RAW

SLUDGE DIGESTION and DISPOSAL

MONTH	RAW SLUDGE			DIGESTED SLUDGE			SUPERNATANT		SLUDGE DISPOSAL	
	VOLUME 10^3 gal	T.S. %	V.S. %	VOLUME 10^3 gal	T.S. %	V.S. %	VOLUME gal	T.S. %	LIQUID yd^3	DEWATERED yd^3
JAN	14.8	2.7	-	14.0	8.4	-	-	-	0	0
FEB	6.3	-	-	6.0	-	-	-	-	0	0
MAR	12.6	-	-	11.0	-	-	-	-	0	0
APR	11.4	-	-	15.0	-	-	-	-	0	20
MAY	16.1	6.0	-	23.0	5.6	-	-	-	0	50
JUN	13.3	-	-	17.1	-	-	-	-	0	0
JUL	13.0	-	-	14.5	-	-	-	-	0	150
AUG	13.3	-	-	12.0	-	-	-	-	0	135
SEPT	13.3	-	-	13.5	-	-	-	-	0	0
OCT	14.1	-	-	9.0	-	-	-	-	0	0
NOV	9.9	-	-	19.0	-	-	-	-	0	0
DEC	11.7	-	-	15.0	-	-	-	-	0	0
TOTAL	149.8	-	-	169.1	-	-	-	-	0	355
AVERAGE	12.5	4.3	-	14.0	7.0	-	-	-	0	0

COMMENTS

There are no flow measuring devices for measuring the volumes of raw sludge and digested sludge. The quantities are estimated.

An estimated 149,800 gallons of raw sludge were pumped to the digester, and 169,100 gallons were removed from the digester to the drying beds. Very little supernating is done, and the supernatant is included in the volume out of the digester to the drying beds. The drying beds drain to the wet well of the pumping station.

Date Due

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CONCLUSIONS

The plant was overloaded in 1968. The flows in 1968 exceeded the design capacity for secondary treatment approximately 95 percent of the time, and the resulting quality of the final effluent did not meet the OWRC objectives for secondary treatment.

RECOMMENDATIONS

An engineering report was prepared in 1968 by Canadian Mitchell Associates Limited and it recommended immediate expansion of the treatment facilities and changes to the collector system. These recommendations should be implemented as soon as possible.

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Water management in Ontario